

*A Table of the Elastick power of the Air,
both Experimentally and Hypothetically calculated,
according to its various Dimensions.*

The dimen- sions of the included Air.	The height of the Mer- curial Cylin- der counter- pois'd by the Atmo- sphere.	The Mercu- rial Cylinder added, or taken from the former.	The sum or diffe- rence of these two Cylinders.	What they ought to be accor- ding to the Hypo- thesis.
12	29 +	29 —	58	58
13	29 +	24 $\frac{11}{16}$ —	53 $\frac{11}{16}$	53 $\frac{7}{13}$
14	29 +	20 $\frac{3}{16}$ —	49 $\frac{3}{16}$	49 $\frac{1}{7}$
16	29 +	14 —	43	43 $\frac{1}{2}$
18	29 +	9 $\frac{1}{4}$ —	38 $\frac{1}{4}$	38 $\frac{2}{3}$
20	29 +	5 $\frac{1}{16}$ —	34 $\frac{3}{16}$	34 $\frac{1}{5}$
24	29	0 —	29	29
48	29 —	14 $\frac{5}{8}$ —	14 $\frac{3}{8}$	14 $\frac{1}{2}$
96	29 —	22 $\frac{1}{8}$ —	6 $\frac{7}{8}$	7 $\frac{1}{8}$
192	20 —	25 $\frac{5}{8}$ —	3 $\frac{3}{8}$	3 $\frac{5}{8}$
384	29 —	27 $\frac{3}{8}$ —	1 $\frac{6}{8}$	1 $\frac{7}{16}$
576	29 —	27 $\frac{7}{8}$ —	1 $\frac{1}{8}$	1 $\frac{5}{24}$
768	29 —	28 $\frac{1}{8}$ —	0 $\frac{7}{8}$	0 $\frac{7}{4}$
960	29 —	28 $\frac{5}{8}$ —	0 $\frac{5}{8}$	0 $\frac{4}{8}$
1152	29 —	28 $\frac{7}{16}$ —	0 $\frac{9}{16}$	0 $\frac{10}{16}$

From

From which Experiments, I think, we may safely conclude that the Elater of the Air is reciprocal to its extension, or at least that to apply it to our present purpose (which was the cause of inventing these wayes of tryal) we will suppose it to be definitely extended upwards, [I say a *Cylinder*, not a *Sphere*, because, as I may elsewhere shew in the Explication of the *placate* proportion of the shells of a *Sphere*, to their resistance, I suppose to be removed in this case by the decrease of the *elasticity*] and the pressure of the Air at the bottom of the *Cylinder* strong enough to keep up a *Cylinder* of *Mercury* of the same height, because by the most accurate tryals of the most illustrious and reasonable Mr. *Boyle*, published in his deservedly famous *Tract* the weight of *Quicksilver*, to that of the Air here be reckoned about as fourteen thousand to one: If we suppose the *Cylinder* of the *Atmosphere* to be every where of an equal thickness (as he there deduces) find it extended to the height of a thousand feet, or seven miles: But because by these Experiments somewhat confirm'd the hypothesis of the reciprocal relation of the Elaters to the Extensions we shall find, that by supposing the *Atmosphere* divided into a thousand parts, each of which is equivalent to thirty five feet, or seven geometrical paces, the divisions containing as much Air as is supposed in a *Cylinder* of the earth of equal diameter, and thirty five foot high, we shall find the most to press against the surface of the Earth with the pressure of the above mentioned thousand parts; the pressure of the second against the top of the first to be 1000 — 1 = 999. against the second to be 1000 — 2 = 998. of the fourth against the third to be 1000 — 3 = 997. of the uppermost against the 999th to be 1000 — 999 = 1. so that the extension of the Air next the Earth, will be to the extension of the next but one, as 1. to 999. for as the pressure sustained by the first, so is the pressure sustained by the first, so is the extension of the first, so is the extension of the 999. so that, from this hypothetical calculation we may find the Air to be indefinitely extended: For if we suppose the thickness of the Air to be divided, as I just now instance, into a thousand parts, and each of those under differing Dimensions to contain an equal quantity of Air, we shall find, that the *Cylinder* whose Base is supposed to lean on the Earth, will be found to be 35 $\frac{33}{99}$ foot; the second equal Division, or *Cylinder*, supposed to lean on the top of the first, shall have its top at 35 $\frac{70}{99}$; the third 35 $\frac{103}{99}$; the fourth 35 $\frac{140}{99}$; and so on, each equal quantity of Air having its dimensions measured by the same additional number express'd alwayes in the manner of a fraction, whose numerator is alwayes the number of the place multiplied, and whose denominator is alwayes the pressure of the *Atmosphere* at that part, so that by this means we may easily calculate the dimensions of those 1000. divisions, I suppose'd; where as

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